ABSTRACT OF THE DISCLOSURE

A router includes a classifier that classifies packets assigned to 2^{n+m} classes of service into 2^n classes of service that are supported by the router. The classifier then sets the loss priorities of the respective packets to one of m levels. The router uses a modified

5 weighted random early detection scheme that is based on probabilities of discard associated with the 2^{n+m} classes of service to determine whether to retain or discard particular packets. The router uses a single buffer to store packets directed to all of the various output ports. The available storage locations in the buffer are linked to a free queue and a weighted average depth of the free queue, is used to determined whether or

10 not to retain a given packet. The router compares the weighted average depth of the free queue to maximum and minimum thresholds associated with the particular 2^{n+m} class of service to which the packet is assigned. If the weighted average is above the maximum threshold, the packet is retained. If the weighted average is below the minimum threshold, the packet is discarded. If the weighted average is between the two thresholds,

15 a probability of discard that is based on the 2^{n+m} classes of service is calculated and compared to a random value to determine whether or not the packet should be retained. If the probability of discard exceeds the random value, the packet is discarded. Otherwise, the packet is retained. The retained packets are then transferred through the various output ports of the router based on weighting factors associated with the 2^n

20 classes of service.